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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,263	02/19/2004	Sundeep Chauhan	STL 3462	7315

7590 04/06/2007

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EXAMINER	
BIBBINS, LATANYA	
ART UNIT	**PAPER NUMBER**
2627	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,263	CHAUHAN ET AL.	
	Examiner	Art Unit	
	LaTanya Bibbins	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-8,13 and 15* is/are rejected.

7)☒ Claim(s) *5,9-12,14 and 16-20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-4, 13, and 15 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 13, and 15 of U.S. Patent No. 6,979,831 B2 (herein '831) in view of Maeda et al. (US Patent No. 4,067,044).

Regarding claims 1-4, instant claims 1-4 recite an electron beam substrate processing apparatus, comprising: substrate processing chamber, a spindle motor assembly, a spindle shaft, a substrate support member, an encoder wheel, an optical detector, an electron beam assembly, an actuator, and a vacuum pump, which correspond respectively to claims 1-4 of '831. Instant claim 1 also recites a pattern

generator circuit configured to generate an electron beam control signal in response to the rotation data signals, wherein the electron beam control signal frequency varies as a function of at least one processing radius and angular velocity associated thereto. Although claim 1 of '831 recites a controller configure to output corrected pattern clock signals in response to the rotation data signals, claim 1 of '831 fails to recite a pattern generator circuit configured to generate an electron beam control signal in response to the rotation data signals, wherein the electron beam control signal frequency varies as a function of at least one processing radius and angular velocity associated thereto.

Maeda, however, discloses an information recording apparatus wherein the electron beam control signal frequency varies as a function of at least one processing radius and angular velocity associated thereto (see column 5 lines 25-28, column 5 lines 53-55, and column 5 line 64 – column 6 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Maeda into '831. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to "provide an information retrieval or reproducing apparatus in which means are provided so that desired information can be selectively reproduced at a high speed and accurately from among many information recorded" (Maeda column 1 lines 63-68).

Regarding claims 6-8, instant claims 6-8 recite a method of processing substrates with an electron beam processing system, comprising: rotating a substrate support member, generating rotation data signals, generating pattern clock signals,

generating an electron beam processing pattern, optically detecting the rotational movements of an encoder wheel, and processing at least some of the rotation data signals with a motor control circuit, which correspond respectively to claims 6-8 of '831. Instant claim 6 also specifically recites generating pattern clock signals from the rotation data signals that vary in frequency as a function of at least one processing radius and an angular velocity associated thereto and generating an electron beam processing pattern that varies in angular dimension as a function of the at least one processing radius.

While claim 6 of '831 does not specifically recite generating an electron beam processing pattern that varies in angular dimension as a function of the at least one processing radius, processing patterns that vary in angular dimension as a function of processing radius is an inherent property of constant angular velocity recording. In addition, although claim 6 of '831 recites generating corrected pattern clock signals from the rotation data signals, claim 6 of '831 fails to specifically recite that the pattern clock signals vary in frequency as a function of at least one of processing radius and an angular velocity associated thereto.

Maeda, however, discloses an information recording apparatus wherein the signal frequency varies as a function of at least one processing radius and angular velocity associated thereto (see column 5 lines 25-28, column 5 lines 53-55, and column 5 line 64 – column 6 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Maeda into '831. One of

ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to "provide an information retrieval or reproducing apparatus in which means are provided so that desired information can be selectively reproduced at a high speed and accurately from among many information recorded" (Maeda column 1 lines 63-68).

Regarding claims 13 and 15, instant claims 13 and 15 recite an apparatus for processing a substrate with electron beams, comprising: rotation means, signal generator means, and wherein the rotation means comprises a movable spindle motor assembly, which correspond respectively to claims 13 and 15 of '831.

Instant claim 13 also recites means for generating a pattern clock signal from the axial rotation of the substrate that varies in frequency as a function of radial processing position and angular velocity of the substrate associated thereto and an electron beam generation means for processing the substrate with electron beams associated with the pattern clock signal.

Claim 13 of '831 recites processing at least some of the corrected pattern clock signals to generate a corrected electron beam processing pattern for writing a pattern on a surface of the substrate which corresponds to the electron beam generation means in the instant claim. However, although claim 13 of '831 recites generating a corrected pattern clock signal form the rotation of data signals, claim 13 of '831 fails to specifically recite that the pattern clock signal varies in frequency as a function of radial processing position and angular velocity of the substrate.

Maeda, however, discloses an information recording apparatus wherein the signal frequency varies in frequency as a function of radial processing position and angular velocity of the substrate (see column 5 lines 25-28, column 5 lines 53-55, and column 5 line 64 – column 6 line 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Maeda into '831. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to "provide an information retrieval or reproducing apparatus in which means are provided so that desired information can be selectively reproduced at a high speed and accurately from among many information recorded" (Maeda column 1 lines 63-68).

Allowable Subject Matter

3. Claims 5, 9-12, 14, and 16-20 are objected to as being dependent upon a rejected base claim.

4. Claims 1-20 would be allowable upon submission of a timely filed terminal disclaimer, in compliance with 37 CFR 1.321(c) or 1.321(d), as set forth in this Office Action.

5. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 1-5, none of the references of record, alone or in combination, suggest or fairly teach an electron beam substrate processing apparatus,

comprising: a substrate processing chamber defined by sidewalls, a bottom, and a top; a spindle motor assembly moveably disposed within the substrate processing chamber; a spindle shaft extending from the spindle motor assembly toward the top; a substrate support member mounted to an end of the spindle shaft distal the spindle motor assembly; an encoder wheel coupled to the spindle shaft and positioned adjacent the substrate support member; an optical detector positioned in optical communication with the encoder wheel, the optical detector being configured to generate rotation data signals in response to detected rotation of the encoder wheel; **a pattern generator circuit configured to generate an electron beam control signal in response to the rotation data signals, wherein the electron beam control signal frequency varies as a function of at least one processing radius and angular velocity associated thereto;** and an electron beam assembly responsive to the electron beam control signal, the electron beam assembly being disposed on the substrate processing chamber and configured to direct the electron beam onto a surface of the substrate for processing in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper.

Regarding claims 6-12, none of the references of record, alone or in combination, suggest or fairly teach a method of processing substrates with an electron beam processing system, comprising: rotating a substrate support member configured to hold the substrate thereon for processing; generating rotation data signals from one encoder assembly associated with a rotational movement of the substrate support member; **generating pattern clock signals from the rotation data signals that vary**

in frequency as a function of at least one processing radius and an angular velocity associated thereto; and generating an electron beam processing pattern for writing a pattern on a surface of the substrate from at least some of the pattern clock signals, wherein the processing pattern varies in angular dimension as a function of the at least one processing radius in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper.

Regarding claims 13-20, none of the references of record, alone or in combination, suggest or fairly teach an apparatus for processing a substrate with electron beams, comprising: rotation means for rotating a substrate support member for processing the substrate thereon; signal generator means for generating a rotation clock signal from the axial rotation of the substrate; **means for generating a pattern clock signal from the axial rotation of the substrate that varies in frequency as a function of radial processing position and angular velocity of the substrate associated thereto;** and an electron beam generation means for processing the substrate with electron beams associated with the pattern clock signal in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper.

Citation of Relevant Prior Art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hrinya et al.(US Patent No. 6,204,989) teaches an optical, not electron beam, exposure apparatus and method having an encoder coupled to the shaft on which the

substrate is set where the encoder produces circumferential position information (columns 4 and 5). However, the prior art fails to teach that this information is utilized to correct the timing of the pattern writing as required in the independent claims.

Tomita (USPGPUB 2003/0021206) discloses electron beam substrate processing apparatus, comprising a substrate processing chamber, a spindle motor assembly, a substrate support member, an electron beam assembly configured to direct an electron beam onto a surface of the substrate for processing, an encoder wheel and detector positioned in communication with the encoder wheel. However, Tomita's detector is not configured to output rotation data signals in response to detected rotation of the encoder wheel, but instead, to detect the wobbling shape of the waveform of the recording track.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaTanya Bibbins whose telephone number is (571) 270-1125. The examiner can normally be reached on Monday through Friday 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LaTanya Bibbins

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER